Docket No. 56075-PCT-CIP-C (45858)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: Fomovskaia et al. EXAMINER: C. Wilder

SERIAL NO. 10/676,872 GROUP ART UNIT: 1645

FILED: September 30, 2003

FOR: FTA-COATED MEDIA FOR USE AS A MOLECULAR DIAGNOSTIC TOOL

Mail Stop: Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION OF DR. WALTER KING PURSUANT TO 37 CFR 1.132

I, Dr. Walter King, declare as follows:

1. I am presently the Vice President of Research & Development at Whatman PLC, United Kingdom, and I am based in the Whatman U.S.-subsidiary facility in Sanford, Maine. I have been employed in this position since 2006. I am an experienced Ph.D. with an extensive background in Bacteriology & Immunology, Virology, and Microbiology & Urology. I am responsible for managing all aspects of global research and development activities at Whatman PLC, including development and implementation of the product portfolio. Prior to my current position at Whatman, I had previously (2005-2006) been employed as a Director of the Applications Development Group at Nanosphere, Inc., in Northbrook, IL, where I was in charge of development of In Vitro Diagnostic (IVD) products for genetic and infectious disease testing using single nucleotide polymorphism detection technology in patient samples without amplification. Prior to that, I had been a Senior Director of Product Development in the Vysis Diagnostic Division and Molecular Oncology Program Director at Abbott Laboratories (2002-2005) in Downers Grove, IL, where I was in

charge of development of microarray IVD products for molecular cytogenetics and oncology; and a Director of the Genomic Microarray Platform program (1999-2001; genomic array-based assay products for the detection of amplification and deletions for solid tumors, leukemias, lymphomas and prenatal applications) and a Senior Manager of Assay Development (1995-1998; IVD's for Her-2 detection in breast cancer [PMA approval], multiplex aneuploidy detection in bladder cancer [510K approval], and pre-implantation testing in blastomeres and polar bodies) at Vysis, Inc. in Downers Grove, IL. I was also a Senior Scientist in Assay Development (1986-1995; assay formats and chemistries for an automated clinical analyzer; amplification chemistry for detection of respiratory, gastrointestinal and sexually transmitted disease panels; manual non-isotopic probase-based test for detection of Listeria, Salmonella and E. coli) at Gene-Trak Systems, Inc., in Framingham, MA; and was employed in the Biotechnology Group (1985-1986; development of nucleic acid probe technology for the detection of clinical pathogens) of AMOCO Corporation in Naperville, IL. I have been active in the development of various products, have been listed as an inventor on several patents, and have co-authored over thirty publications. I hold a Bachelor of Arts (1973) from the Department of Bacteriology and Immunology of the University of California in Berkeley, CA. I hold a Ph.D. in Virology (1980) from the University of Chicago in Chicago, IL. I served as a Postdoctoral Fellow in the Department of Medicine at the University of Chicago (1980-1982), where I identified the transforming region in the Epstein-Barr Virus (EBV) genome, and in the Departments of Microbiology and Urology at Columbia University Medical Center in New York, NY (1982-1985), where I identified genes involved in the differentiation of embryonal carcinoma cells. I am a member of the American Association for Cancer Research.

2. The subject application discloses among other things and claims a kit for indicating the presence of nucleic acid in a sample, the kit comprising a dry substrate for lysing cells and purifying nucleic acid therefrom consisting of a solid matrix, wherein the solid matrix comprises nitrocellulose or nylon and a coating sorbed to the solid matrix, wherein the coating comprises a cellular lysis reagent comprising an anionic surfactant or

detergent at a concentration sufficient to induce cellular lysis; and an indicator for detecting the presence of nucleic acid, which is maintained on the solid matrix, the indicator comprising an external substance which generates a signal in an assay. It also discloses among other things and claims a kit for purifying nucleic acid comprising a dry substrate comprising a solid matrix, wherein the solid matrix comprises nitrocellulose or nylon; and a coating sorbed to the solid matrix, wherein the coating comprises a cellular lysis reagent comprising an anionic surfactant or detergent at a concentration sufficient to induce cellular lysis; an indicator for detecting the presence of nucleic acid, which is maintained on the solid substrate, the indicator comprising an external substance which generates a signal in an assay; and an integrity maintenance means for preserving the matrix and purifying nucleic acid. It also discloses among other things and claims a blood card for labeling blood transfusion bags comprising a dry substrate comprising a solid matrix selected from the group consisting of nitrocellulose, carboxymethylcellulose, polyester, polyamide, polytetrafluoroethylene and porous ceramics, wherein the solid matrix further comprises a chemical coating sorbed to the solid matrix, the chemical coating comprising a weak base; a chelating agent; and a cellular lysis reagent comprising an anionic surfactant or detergent at a concentration sufficient to induce cellular lysis; and an indicator for detecting the presence of nucleic acid, which is maintained on the solid matrix, the indicator comprising an external substance which generates a signal in an assay; and an integrity maintenance means. It also discloses among other things and claims a kit for labeling blood transfusion bags comprising a dry substrate comprising a solid matrix selected from the group consisting of nitrocellulose, carboxymethylcellulose, polyester, polyamide, polytetrafluoroethylene and porous ceramics, the solid matrix being coated with a chemical coating sorbed to the solid matrix, the chemical coating comprising a weak base, a chelating agent, and a cellular lysis reagent comprising an anionic surfactant or detergent at a concentration sufficient to induce cellular lysis; an indicator for detecting the presence of nucleic acid, which is maintained on the solid matrix, the indicator comprising an external substance which generates a signal in an assay; and an integrity maintenance means. It also discloses among other things and claims a kit for purifying nucleic acid comprising a dry substrate for lysing cells and purifying nucleic acid

comprising a solid matrix comprising nitrocellulose, the solid matrix being coated with a chemical coating sorbed to the solid matrix, the chemical coating comprising a weak base; a chelating agent; and a cellular lysis reagent comprising an anionic surfactant or detergent at a concentration sufficient to induce cellular lysis; and an indicator for detecting the presence of nucleic acid, wherein the indicator comprises an external substance which generates a signal in an assay; and the indicator comprises a polyethyleneimine conjugate or an enzyme-linked immunosorbant assay (ELISA).

3. Traditionally, a sample containing nucleic acid (including, but not limited to, a biological sample, such as a cell sample) has been used for isolation of nucleic acid. Cells in the sample have been lysed, and the nucleic acid extracted, optionally washed, and isolated. The method typically required a series of steps applying various reagents, engaging in one or more centrifugation steps, and transferring materials between test tubes, microfuge tubes, or microwell plates. The isolation method typically required precipitation with alcohol at a low temperature (e.g., at, or more often below, 0°C; usually between -20°C and -70°C). More recently, suspensions (e.g., suspension of coarse silica in a chaotrope) and filters have been developed, whereby the nucleic acid is sorbed or entrapped on the solid moiety of the suspension or on the filter. The sample would be chemically treated to lyse the cells and release the nucleic acid prior to exposure to the solid moiety of the suspension or to the filter, or the filter would have a chemical coating including a detergent or surfactant for cell lysis. A commonly used material for such a filter was cellulose. The nucleic acid would then be subjected to various types of analyses. Typically, nucleic acid was often removed from the filter or solid moiety of the suspension prior to analysis. Alternatively, the nucleic acid bound to the filter or solid moiety was subjected to amplification (e.g., PCR amplification), particularly if the amount of the nucleic acid was small. Thus, removal or amplification of the nucleic acid prior for analysis required additional effort, time and materials.

4. The current invention addresses these concerns and many other issues as well, such as protection from contamination, and provides a kit.

5. I have reviewed the Patent Office Action ("Office Action") dated April 27, 2007, issued in connection with the subject application. As I understand the Office Action, the Patent Examiner has rejected certain claims of the application in view of documents that include the following: U.S. Patent 4,789,630 (Bloch et al.; granted Dec. 6, 1988; "Bloch"); U.S. Patent 5,496,562 (Burgoyne; granted March 5, 1996; "Burgoyne"); U.S. Patent 5,589,154 (Anderson; granted Dec. 31, 1996; "Anderson"); and Ahern (The Scientist, 20 (15): 1-5; February 1999; "Ahern").

6. I disagree with these claim rejections.

7. The current invention illustrates that it is possible produce a kit to detect and analyze small quantities of nucleic acid on a **dry** solid medium/substrate comprising a solid matrix and a chemical coating, **sorbed to** the matrix, which comprises **a cellular lysis reagent** comprising an **anionic** surfactant or detergent **at a concentration sufficient to induce cellular lysis**. The kit also comprises an indicator for detecting the presence of nucleic acid, which is **maintained on the solid matrix**, the indicator comprising **an external substance which generates a signal in an assay**.

8. In contrast, Bloch is directed to Southern blotting, dot blotting, and similar techniques and applies purified DNA in an anionic detergent solution to a solid membrane surface for the detection of specific areas of the DNA or, alternatively, the use of such detergents to wash the solid phase after incubation for blocking purposes in order to reduce background with respect to analytical sensitivity (e.g., col. 20; lines 22-39).

9. For instance, in Example 5, Bloch screens isolated, restriction digested, and electrophoresed human DNA (not cells) and uses 0.5% (w/w) SDS in a prehybridization solution (5X Denhardt's solution with 50% formamide, 5X SSPE, 0.5% (w/w) SDS, 0-10% (preferably 5%) dextran sulfate and 150 _g/ml denatured herring sperm DNA) (col. 33, lines

54-59) and 0.5% SDS (w/v) in a hybridization solution (5X Denhardt's solution with 50% formamide, 5X SSPE, 0.5% (w/w) SDS, 0-10% dextran sulfate, 150 _g/ml denatured herring sperm DNA and 50-200 ng probe) (col. 33, lines 60-67). Subsequently in Example 5, detection takes place after rinsing the blot with Buffer A, to which an unspecified amount of 5% Triton X-100 has been added. Although the final concentration of Triton X-100 is not provided, the addition of 5% Triton X-100 to another solution would result in a final concentration of less than 5%. Moreover, Triton X-100 is **a non-ionic detergent** and not the anionic surfactant or detergent of the present invention. In Example 6, cell lysis takes place in a tissue culture dish to which a lysis buffer (0.20 M LiCl, 0.020 M Tris CL, 0.001 M EDTA, 0.5% Nonidet P-40 and 0.05% aprotinin, pH 80) has been added directly, followed by addition of an equal volume of 5% SDS, 1M dithiotreitol, 10% glycerol, 0.005% bromphenol blue, 0.125 M Tris Cl, pH 6.8 (col. 36, lines 40-47). Addition of an equal volume of a solution comprising 5% SDS to a solution comprising 0.5% Nonidet P-40 results in a solution of **only** 2.5% SDS and 0.25% Nonidet P-40, and **the lysis takes place in solution** in a culture dish – **not on a dry solid medium**. In Example 9, **the DNA is isolated, restriction digested, and electrophoresed** prior to being blotted. In this Example, Bloch used 0.5% SDS in a prehybridization mixture (5X Denhardt's solution with 50% formamide, 5X SSPE, 0.5% SDS, 5% dextran sulfate and 50% formamide) (col. 41, lines 57-60) and the same mixture containing two probes as a hybridization solution (col. 41, lines 62-65).

10. In Example 5, the pre-hybridization and hybridization solutions are only 0.5% SDS, and this Example involves human **DNA, which has already been isolated, restriction digested, and electrophoresed before being transferred to a blot**. During the pre-hybridzation and hybridization steps, **when the Bloch blot is exposed to the SDS, it is wet, unlike the SDS-containing dry solid medium of the present invention**. Although the final concentration of Triton X-100 is not provided, the addition of 5% Triton X-100 to another solution would result in a final concentration of less than 5%. Moreover, Triton X-100 is **a non-ionic detergent** and **not the anionic surfactant or detergent of the present invention**.

In Example 6, addition of an equal volume of a solution comprising 5% SDS to a solution comprising 0.5% Nonidet P-40 results in a solution of **only** 2.5% SDS and 0.25% Nonidet P-40, and **the lysis takes place in solution** in a culture dish – **not on a dry solid medium**. Again, Nonidet P-40 is **a non-ionic detergent** and **not the anionic surfactant or detergent of the present invention**. Moreover, the anionic surfactants of Bloch are directed toward facilitating use of the dye ion, rather than lysing the cells, and to the detection of DNA, for example, as part of a dot blot of previously isolated DNA or a blot of cells which are subsequently lysed by wetting with a separate lysis buffer, or after the DNA has been run on a gel. Again, in Example 9, **the DNA is isolated, restriction digested, and electrophoresed** prior to being blotted. In this Example, Bloch used 0.5% SDS in the prehybridization and hybridization mixtures.

11. In addition, Bloch uses anion concentrations to permit **controllable precipitation** of meriqinone as solid salts on the solid phase for purposes of staining. Bloch defines an "effective amount of an effective anion or polymeric anion" as referring to "the amount of an appropriate anion or polymeric anion which will cause formation of a solid salt or immobilized complex of the anion or polymeric anion with the meriquinone of the benzidine or substituted benzidine, which ever [sic] is used in the process, which salt or immobilized complex has a **meriquinone solubility below 10^{-5}M**" (col. 11; ll. 20-27; emphasis added) and states that "[i]ncreased anion concentration and lowered reaction temperature favor salt precipitation or complex ion formation, with **anion concentrations of 10^{-3} to 10^{-1} M** and reaction temperatures of 0 to 60 C being preferred" (col. 17; ll. 12-16; emphasis added).

12. In contrast, Bloch does not disclose or suggest the present invention, which, among other things, is directed to a kit comprising a **dry** substrate, the **dry** substrate comprising a solid matrix **and** a coating **sorbed to** the solid matrix. With respect to the present claims, the "**cellular lysis reagent** comprising an anionic surfactant or detergent" is present "**at a concentration sufficient to induce cellular lysis**." Moreover, **at the**

concentrations sufficient to induce lysis, the **enzymatic detection methods of Bloch** would be **inoperable** due to the denaturation of the enzyme.

13. The quantification of detergent with respect to lysis would be the measurement of the amount of nucleic acid, both DNA or RNA by enzymatic detection which are intracellular. In addition, the ability to measure these targets in this manner would be indicative of de-proteinization of the chromatin proteins which cover the DNA. At a low concentration of detergent, the amount of DNA detected would be lower and would increase with increased detergent concentration to a point, after which it would plateau. Other detergents, including those used in the emulsification of fats, could be used as biological detergents to lyse cells and solubilize cellular and membrane components.

14. There are differences with respect to non-ionic detergents Triton X-100 and NP-40. Brij 34, Tween 20, and Tween 80 are also examples of non-ionic detergents. Although they can lyse cells (particularly unfixed cells) in sufficient concentrations, these detergents generally are not as effective in lysis as ionic detergents.

15. The chemical coating of the present invention is dry. One could determine the mass of detergent dried per unit area of the membrane by comparing the coated and uncoated membrane. The concentration of lysis would be relative to the amount of liquid applied per unit area, (from which the mass of detergent would be known). However, "concentration" refers to the concentration with respect to the chemical coating "solution" applied to the matrix during preparation of the dry solid medium (see, e.g., p. 10).

16. The chemical coating solution of the present invention is described on pages 10-11 of the specification, which teaches that one example of a lysis reagent that can be used in accordance with the present invention is 5% - 10% SDS and notes that increased concentrations of SDS can provide "greater critical micelle concentration which generates greater lysing capability and thus greater yield of target nucleic acid" (p. 11.). The anionic

detergent can be sodium dodecyl sulfate (SDS), but other detergents, such as alky aryl sulphonates, sodium tetradecylsulphate long chain (fatty) alcohol sulphates, sodium 2-ethylhexysulphate olefine sulphates, sulphosuccinates or phosphate esters, can be used in accordance with the invention. Although the concentration of the detergent can vary, it must result in a cellular lysis reagent when comprising the dry solid medium. The typical concentration range for SDS is 5%-10%, preferably 5%-7.5% "for coating particular glass microfiber" described in the specification. At these concentrations, the enzymatic detection methods of Bloch would be inoperable due to inactivation of the detection enzymes. According to the Sigma catalog, Biochemicals, Reagents & Kits for Life Science Research, p. 2188 (Sigma-Aldrich Co., 2006-2007) (copy attached), SDS has a molecular weight (FW) of 288.38. Therefore, 5% - 10% SDS would be the equivalent of 0.17 M – 0.35 M, which would be greater than the 10^{-3}M – 10^{-1}M range of Bloch. Therefore, the disclosure of Bloch teaches away from the present invention.

17. Bloch also teaches away from Burgoyne, which discloses a "strong anionic detergent that binds to and denatures proteins" (col. 4, ll. 7-8), one that "will denature proteins and the majority of any pathogenic organisms in the sample" (col. 3; ll. 10-11).

18. Burgoyne teaches the use of an ink-stamp or pencil marking.

19. Burgoyne neither discloses nor suggests the present invention.

20. Burgoyne does not teach the indicator of the present invention. The ink-stamp or pencil marking of Burgoyne is not an "indicator comprising an external substance which generates a signal in an assay." In addition, one of ordinary skill in the art would have expected the enzyme of the assay of the present invention to be denatured or otherwise inactivated upon contact with the "cellular lysis reagent comprising an anionic surfactant or detergent at a concentration sufficient to induce cellular lysis."

21. The teachings of Bloch and Burgoyne, either alone or in combination, do not suggest the kits of the present invention.

22. Ahern discusses kits in a very general way, without disclosing an indicator for detecting the presence of nucleic acid, which is maintained on the dry solid medium of the present invention, the indicator comprising an external substance which generates a signal in an assay. In addition, one of ordinary skill in the art would have expected the enzyme of the assay of the present invention to be denatured or otherwise inactivated upon contact with the "cellular lysis reagent comprising an anionic surfactant or detergent at a concentration sufficient to induce cellular lysis."

23. Ahern does not suggest the kits of the present invention, either alone or in combination with Burgoyne and/or Bloch.

24. Anderson discusses the ELISA assay in general, but does not suggest the kits of the present invention, either alone or in combination with Burgoyne and/or Bloch and/or Ahern.

25. I hereby further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: October 29, 2007

Walter King

Walter King, Ph.D.

US$ **Sodium 5,5-diethylbarbiturate** (continued)

R: 22 S: 36 EC No. 205-613-9

B0500-25G	25 g	36.80
B0500-100G	100 g	96.30
B0500-500G	500 g	321.50

Sodium diethyldithiocarbamate trihydrate

Cupral; Diethyldithiocarbamic acid sodium salt
$(C_2H_5)_2NCSSNa \cdot 3H_2O$ FW 225.31 *[20624-25-3]*
Inhibits induction of macrophage nitric oxide synthase.
Spin trap used in conjunction with Fe^{2+} to detect NO in brain, kidney, liver, and other tissues.
May form insoluble oxidation products in storage. Sensitivity in colorimetric copper determination not usually affected.
R: 22-38-41 S: 26-39 EC No. 205-710-6 [-20°C]

D3506-100G	100 g	46.10
D3506-500G	500 g	153.00

Sodium dihydrogen citrate, see Sodium citrate monobasic *Page* 2185
Sodium dihydrogen phosphate, see Sodium phosphate monobasic *Page* 2202

Sodium 2,3-dimercaptopropanesulfonate monohydrate

2,3-Dimercaptopropanesulfonic acid sodium salt monohydrate; DMPS
$HSCH_2CH(SH)CH_2SO_3Na \cdot H_2O$ FW 228.29 *[207233-91-8]*
~95%
EC No. 223-796-3 [2-8°C]

D8016-250MG	250 mg	37.10
D8016-1G	1 g	104.50

Sodium dioxoarsenate, see Sodium (meta)arsenite *Page* 2196
Sodium diphosphate tetrabasic, see Sodium pyrophosphate tetrabasic *Page* 2205
Sodium disulfite, see Sodium metabisulfite *Page* 2196

Sodium dithionite

Sodium hydrosulfite; Sodium hypodisulfite
NaO_2SSO_2Na FW 174.11 *[7775-14-6]*
technical grade, 85%
R: 7-22-31 S: 26-28-43-7/8 EC No. 231-890-0

157953-5G	5 g	19.50
157953-100G	100 g	24.20
157953-2KG	2 kg	63.30

Sodium dithionite, see Sodium hydrosulfite *Page* 2192

Sodium 1-dodecanesulfonate

$CH_3(CH_2)_{11}SO_3Na$ FW 272.38 *[2386-53-0]*
S: 22-24/25 EC No. 219-200-6

D5266-1G	1 g	63.10

Sodium dodecanoate

Dodecanoic acid sodium salt; Lauric acid sodium salt; Sodium laurate
$CH_3(CH_2)_{10}COONa$ FW 222.30 *[629-25-4]*
Sigma Grade, 99-100%
R: 36/37/38 S: 26-36 EC No. 211-082-4

L9755-5G	5 g	26.00
L9755-25G	25 g	78.70
L9755-100G	100 g	231.50

Sodium dodecylbenzenesulfonate

Dodecylbenzenesulfonic acid sodium salt
$CH_3(CH_2)_{11}C_6H_4SO_3Na$ FW 348.48 *[25155-30-0]*
~80%
Purity based on total alkylbenzenesulfonate content. Higher and lower homologs are present.
R: 22-37/38-41 S: 26-27-36/37/39 EC No. 246-680-4

D2525-250G	250 g	25.00
D2525-1KG	1 kg	38.20

▼ Sodium dodecyl sulfate

Lauryl sulfate sodium salt; SDS
[151-21-3]

Sodium dodecyl sulfate

Dodecyl sodium sulfate; Dodecyl sulfate sodium salt; Sodium lauryl sulfate
$CH_3(CH_2)_{11}OSO_3Na$ FW 288.38
Anionic detergent
R: 21/22-36/37/38 S: 26-36/37 EC No. 205-788-1

▸ for molecular biology, ≥98.5% (GC)

$A_{260nm}^{3\%}$, solution	<0.3		
$A_{280nm}^{3\%}$, solution	<0.3		
DNase, RNase	none detected	phosphate (PO_4)	<10 ppm
chloride (Cl)	<500 ppm	Pb	<10 ppm

L4390-25G	25 g	26.10
L4390-100G	100 g	42.40
L4390-250G	250 g	112.50
L4390-500G	500 g	167.00
L4390-1KG	1 kg	273.00

▸ for electrophoresis, ≥98.5% (GC)

Used to solubilize and denature proteins for denaturing-PAGE. Most proteins bind SDS in a ratio of 1.4 g SDS per gram of protein. The charges intrinsic to the protein become insignificant compared to the overall negative charge provided by the bound SDS. The charge to mass ratio is essentially the same for each protein and will migrate in the gel based only on their size.
Tested for use in denatured polyacrylamide gel electrophoresis.

$A_{260}^{3\%}$	≤0.1		
$A_{280}^{3\%}$	≤0.1		
turbidity	<2.5 NTU	phosphate (PO_4)	<10 ppm
chloride (Cl)	<500 ppm	heavy metals (as Pb)	<10 ppm

L3771-25G	25 g	29.00
L3771-100G	100 g	47.30
L3771-500G	500 g	159.00
L3771-1KG	1 kg	221.00

▸ SigmaUltra, ≥99.0% (GC)

$A_{260}^{0.1M}$, water	<0.08		
$A_{280}^{0.1M}$, water	<0.05		
solubility			
water	0.1 M at 20 °C, clear, colorless		
loss on drying	≤0.5%, HV, 20-25 °C	Cu	≤0.0005%
		Fe	≤0.0005%
Insoluble matter	passes filter test	K	≤0.02%
chloride (Cl)	≤0.05%	Li	≤0.0005%
phosphate (PO_4)	≤0.0001%	Mg	≤0.0005%
Al	≤0.0005%	Mn	≤0.0005%
Ba	≤0.0005%	Mo	≤0.0005%
Bi	≤0.0005%	Ni	≤0.0005%
Ca	≤0.001%	Pb	≤0.0005%
Cd	≤0.0005%	Sr	≤0.0005%
Co	≤0.0005%	Zn	≤0.0005%
Cr	≤0.0005%		

L6026-50G	50 g	57.10
L6026-250G	250 g	206.50
L6026-1KG	1 kg	649.00

Galina N. Fomovskaia et al.
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Biochemicals, Reagents & Kits

for Life Science Research

CELL CULTURE
GENOMICS
PCR / DNA Amplification
Nucleic Acid Purification
Cloning Systems
FUNCTIONAL GENOMICS
RNA Interference
Gene Expression Analysis
PROTEOMICS
Protein Expression, Purification, and Analysis
METABOLOMICS
ANTIBODIES
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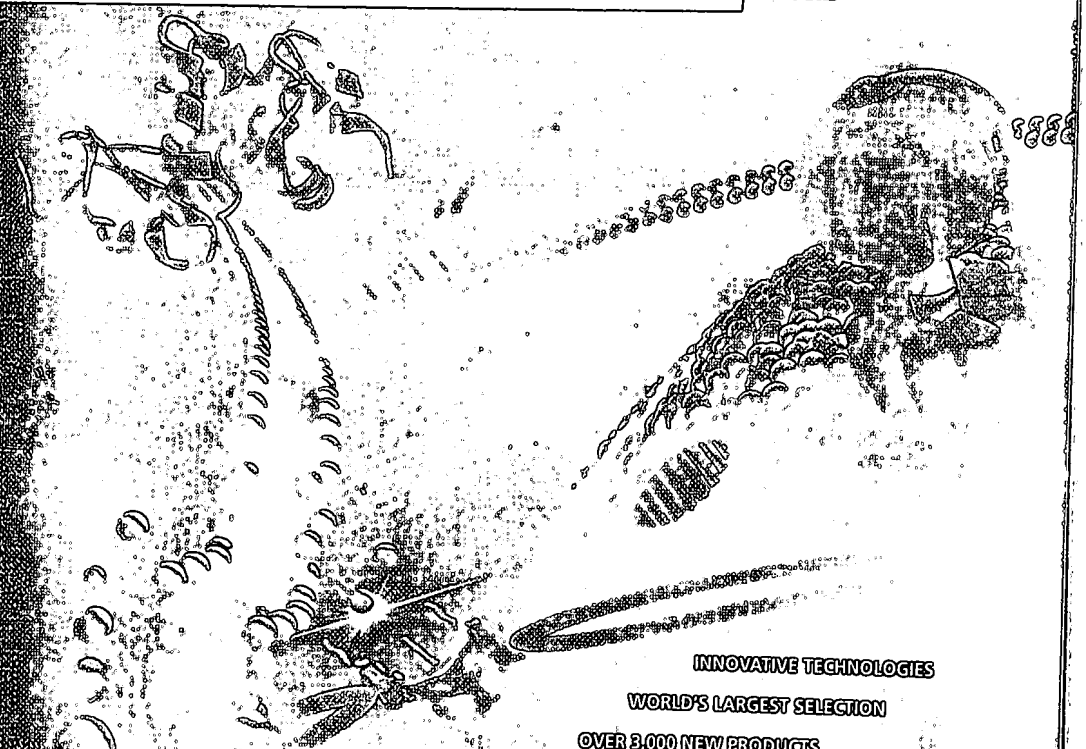

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